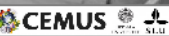


Aligning UK car emissions with Paris (1.5-2°C)

*provisional carbon budget analysis for **LowCVP Annual Conference 2019***



Reframe the question

Not, “what can the UK car sector deliver in terms of reducing emissions?”

Reframe the question

~~Not, what can the UK car sector deliver in terms of reducing emissions~~

... but ...

What total reductions does Paris require the car sector to deliver?

Reframe the question

- To take the Paris *“well below 2°C”* & *“pursue ... 1.5°C”* commitment at *face value*
- To be based on *science* AND *equity*
- To *ignore* political and economic *sensibilities*

This frames a far more challenging mitigation agenda than other analysis

What does the IPCC tell us about Paris?



ipcc

INTERGOVERNMENTAL PANEL ON climate change

CLIMATE CHANGE 2014

Synthesis Report



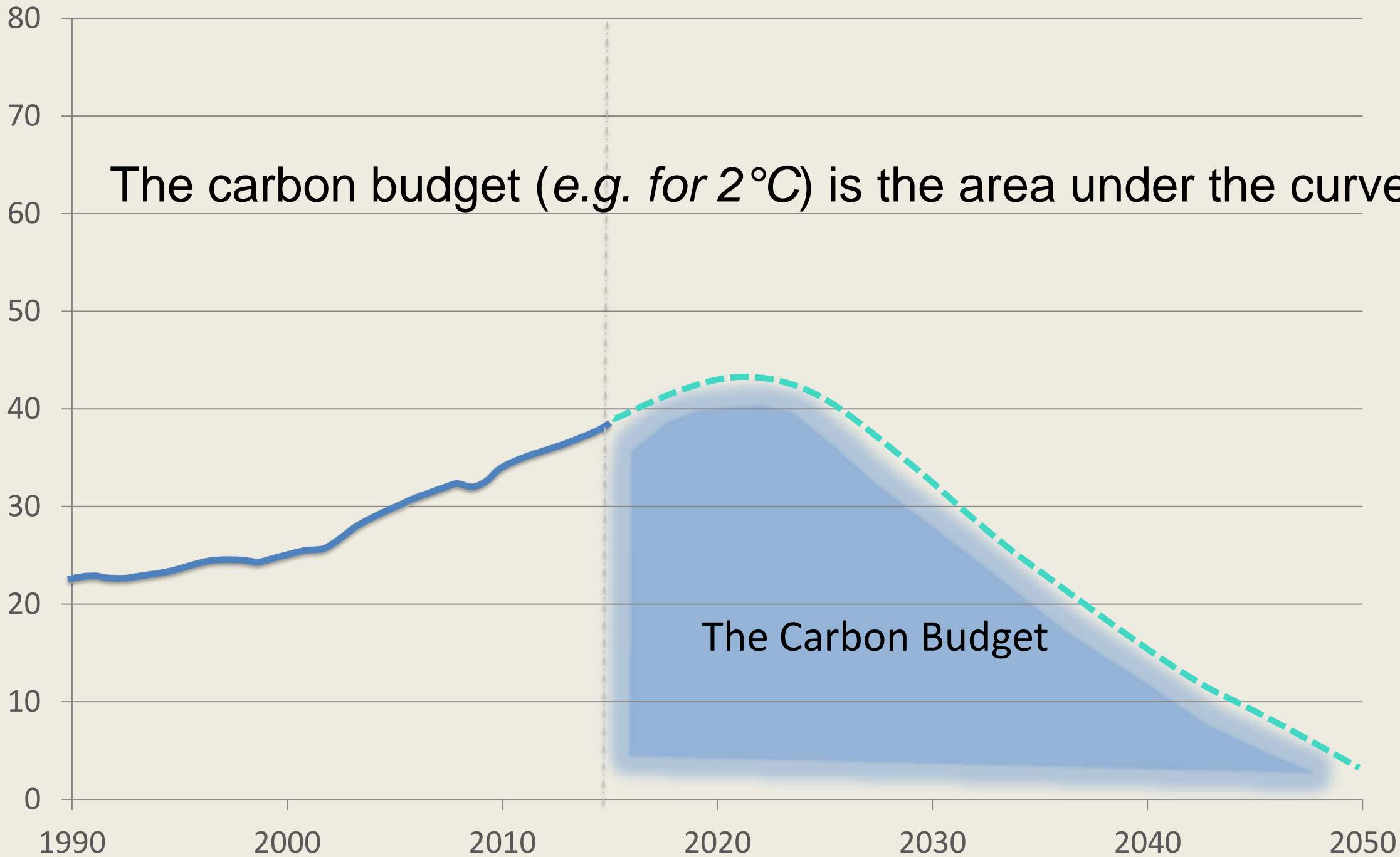
... it is **carbon budgets**, not long-term targets, that link with **temperature rise**



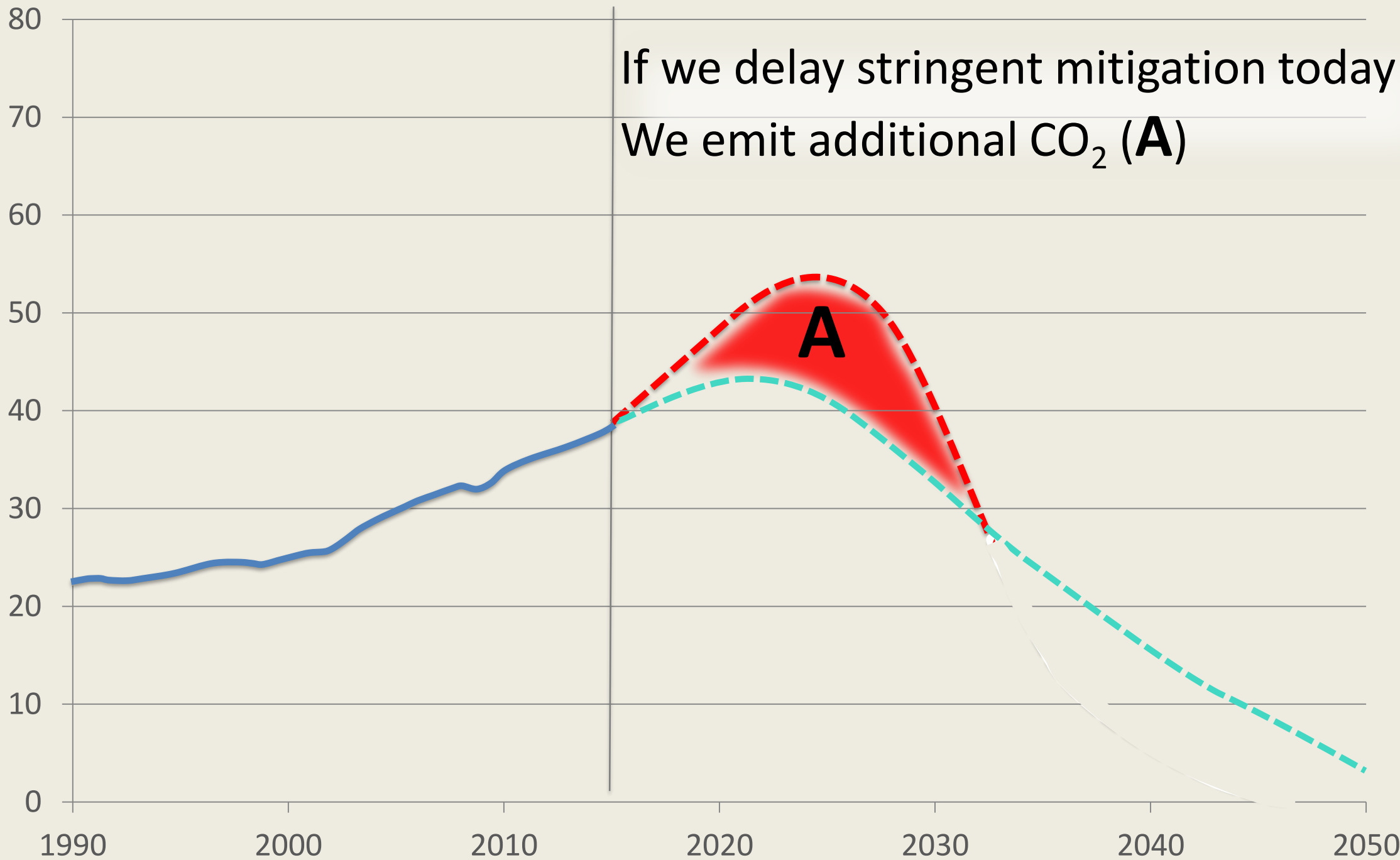
SYNTHESIS REPORT OF THE
FIFTH ASSESSMENT REPORT OF THE
INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE

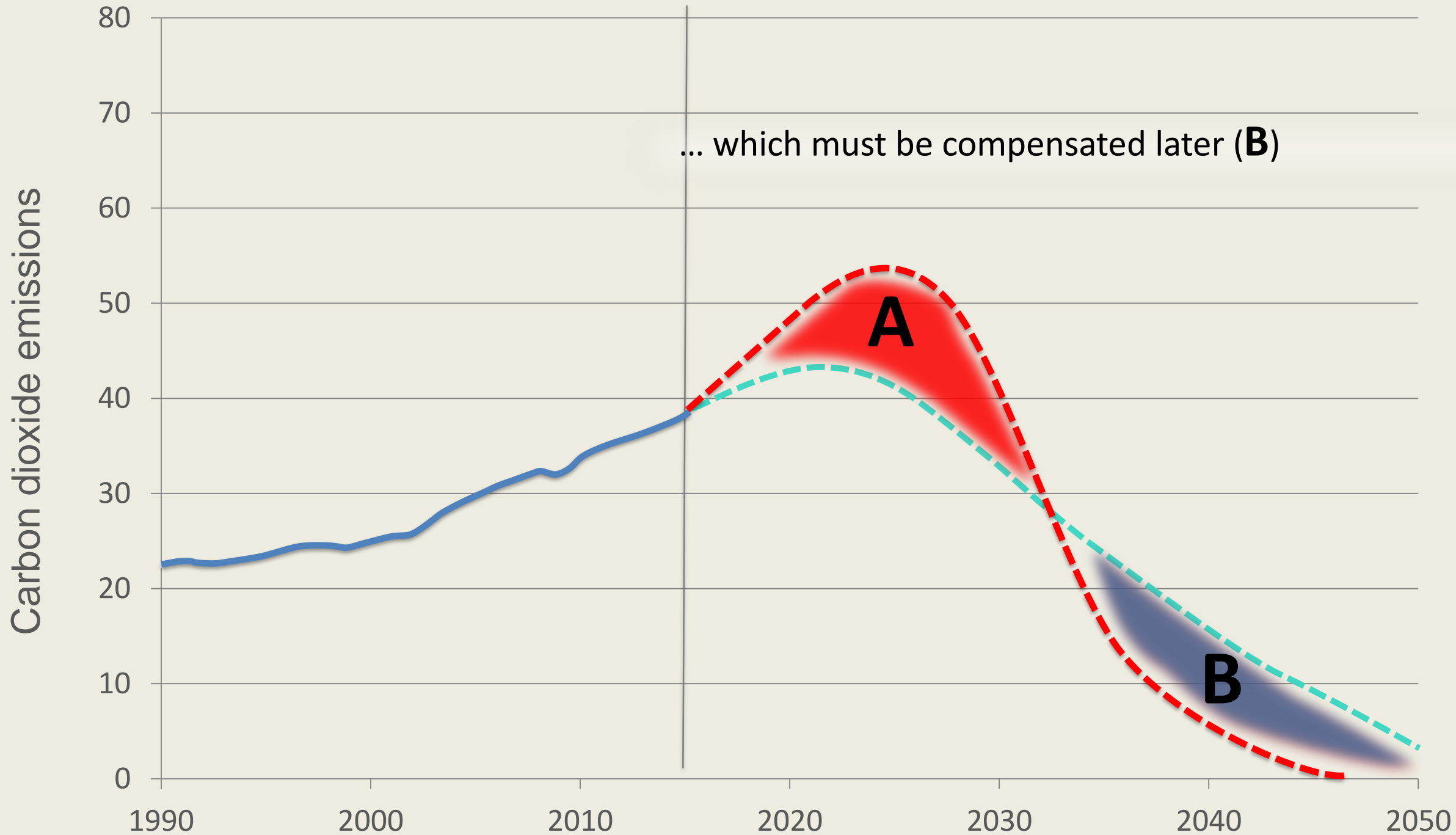


Carbon dioxide emissions

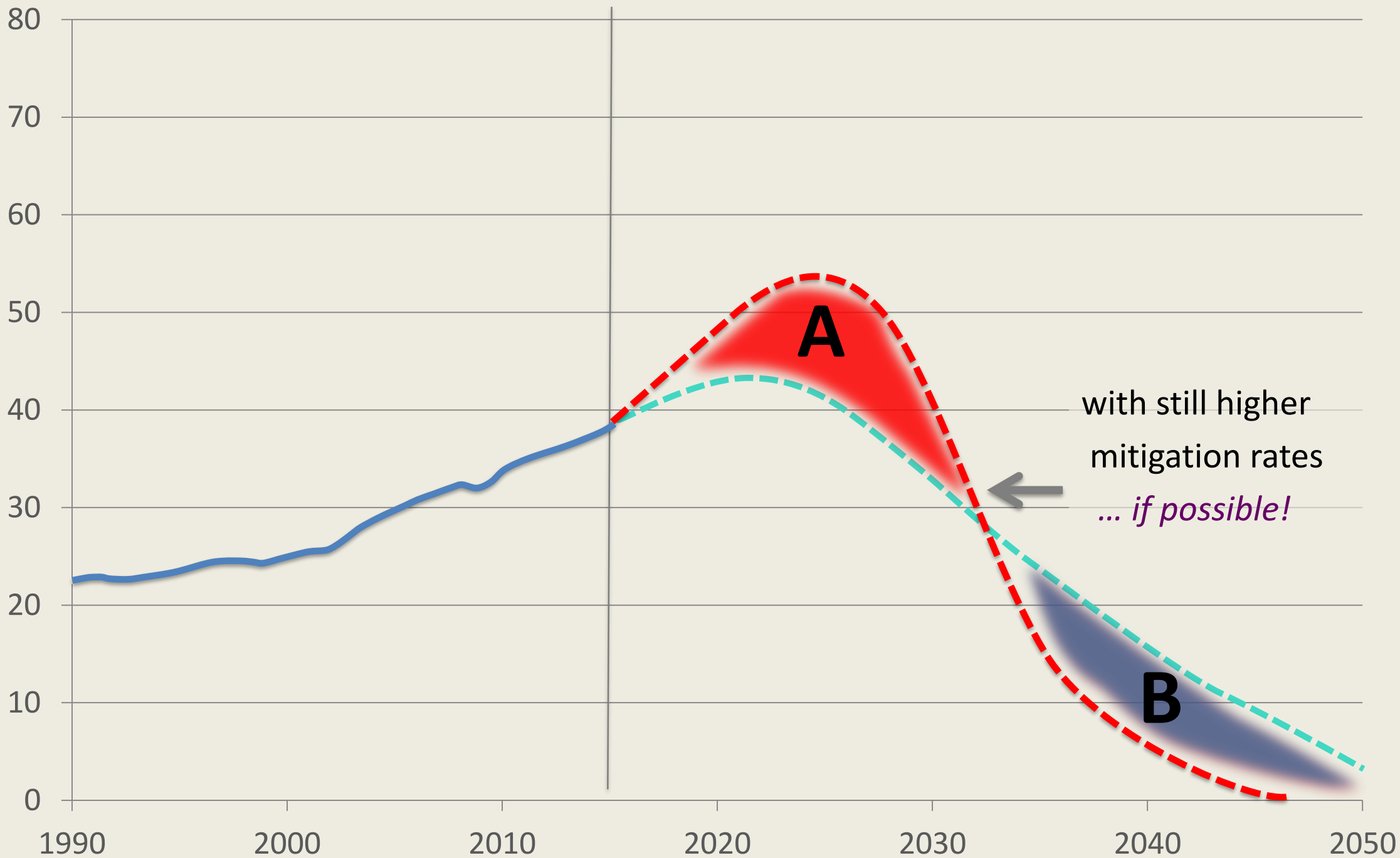


Carbon dioxide emissions





Carbon dioxide emissions



So how big is the “well below 2°C” budget?



According to the IPCC (SR1.5) ...

Table 2.2 | Cumulative carbon dioxide (CO₂) emission consistent with limiting warming to less than stated temperature limits at different levels of probability, based on different lines of evidence. [WGI 12.5.4, WGIII 6]

Cumulative CO ₂ emissions from 1870 in GtCO ₂									
Temperature limit	<1.5°C	1.5-1.66°C	1.67-1.83°C	1.84-2.00°C	<2°C	2-2.16°C	2.17-2.33°C	>2.34°C	>2.5°C
Fraction of simulations meeting goal ^b	66%	50%	33%	66%	50%	33%	66%	50%	33%
Complex models, RCP scenarios only ^c	2200 to 2800	2500 to 3100	2800 to 3400	3100 to 3700	2000 to 2600	2300 to 2900	2600 to 3200	3000 to 3600	3500 to 4100
Simple model, WGIII scenarios ^d	No data	2300 to 2350	2400 to 2950	2550 to 3150	2900 to 3200	2950 to 3800	n.a. ^e	4150 to 5750	5250 to 6000
Complex models, RCP scenarios only ^c	400	550	850	1000	1300	1500	2400	2800	3250
Simple model, WGIII scenarios ^d	No data	550 to 600	600 to 1150	750 to 1400	1150 to 1400	1150 to 2050	n.a. ^e	2350 to 4000	3500 to 4250
Total fossil carbon available in 2011 ^f : 3670 to 7100 GtCO ₂ (reserves) and 31300 to 50050 GtCO ₂ (resources)									

- To meet the Paris “**well below 2 °C**” & “**pursue ... 1.5 °C**” commitment
- From **2020** the global carbon budget for energy is **~650GtCO₂** (to 2100 & beyond)
- In 2018 global CO₂ emissions were **~36GtCO₂**
- i.e. **~18 years** of current emissions

NB: this analysis does not rely on ...

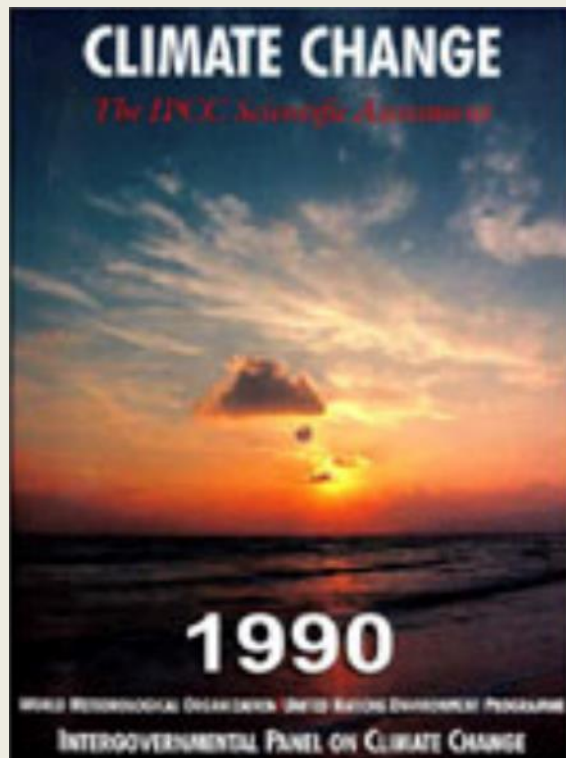
- 1) highly speculative **'Negative Emission Technologies'** *expanding* the budget
- 2) additional feedbacks (&'irreversibilities') *reducing* the budget

*(~all high-level mitigation analyses excludes the latter, but adopts the former,
... often expanding the budget by up to **1 trillion tonnes of CO₂**)*

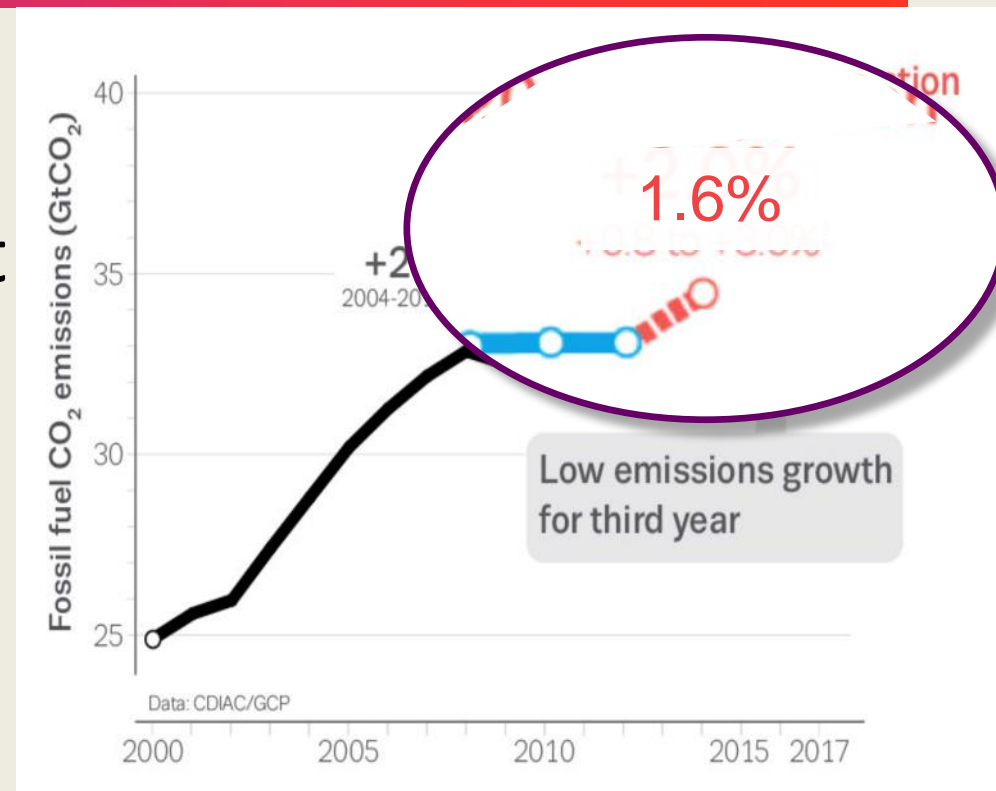
Humility as a starting point



Humility as a starting point



- 1990: first IPCC report
- 2018: CO₂ 67% >1990
- ...still rising in 2018
- ...up by around 1.6%



*Despite optimistic rhetoric, we've delivered
28 years of abject failure in terms of reducing total emissions*

Thus far ... *litany of technocratic fraud*

- Offsetting ... paying a poor person to diet for us
- Clean development mechanism (CDM) ... state sanctioned offsetting
- Emissions trading (EUETS) ... so many permits the €tCO₂ stays low
- Afforestation ... plant a tree, expand an airport
- Speculative 'negative emission technologies' (NETs) ... at huge planetary scale
- Geo-engineering ... a sticking plaster on gangrene

... we have not seriously tried to cut our CO₂!

Just look at the UK



In 2017 emissions were 42% below 1990 levels, provisional 2018 figures are 44% below.



Just look at the UK *(or Sweden, Denmark, France ...)*

But this ignores :

- 1) emissions from aviation and shipping,*
- 2) emissions associated with our imports & exports*
(inc. offshored emissions)

Add these in & the rosy picture looks very different

*... **just a 10% drop since 1990** (i.e. <0.4% p.a.)*

Translating Paris to UK budgets



To limit warming to a 1.5-2°C rise ...

...We need to understand:

the science & maths of climate change



... alternatively

... it's all about pies ...

To limit warming to a 1.5-2°C rise ...

we have a set
global carbon pie
*i.e. total CO₂ that can be
emitted from now to
forever ...*



To limit warming to a 1.5-2°C rise ...

we have a set
global carbon pie

*i.e. total CO₂ that can be
emitted from now to
forever ...*



To limit warming to a 1.5-2°C rise ...

we have a set
global carbon pie

*i.e. total CO₂ that can be
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forever ...*

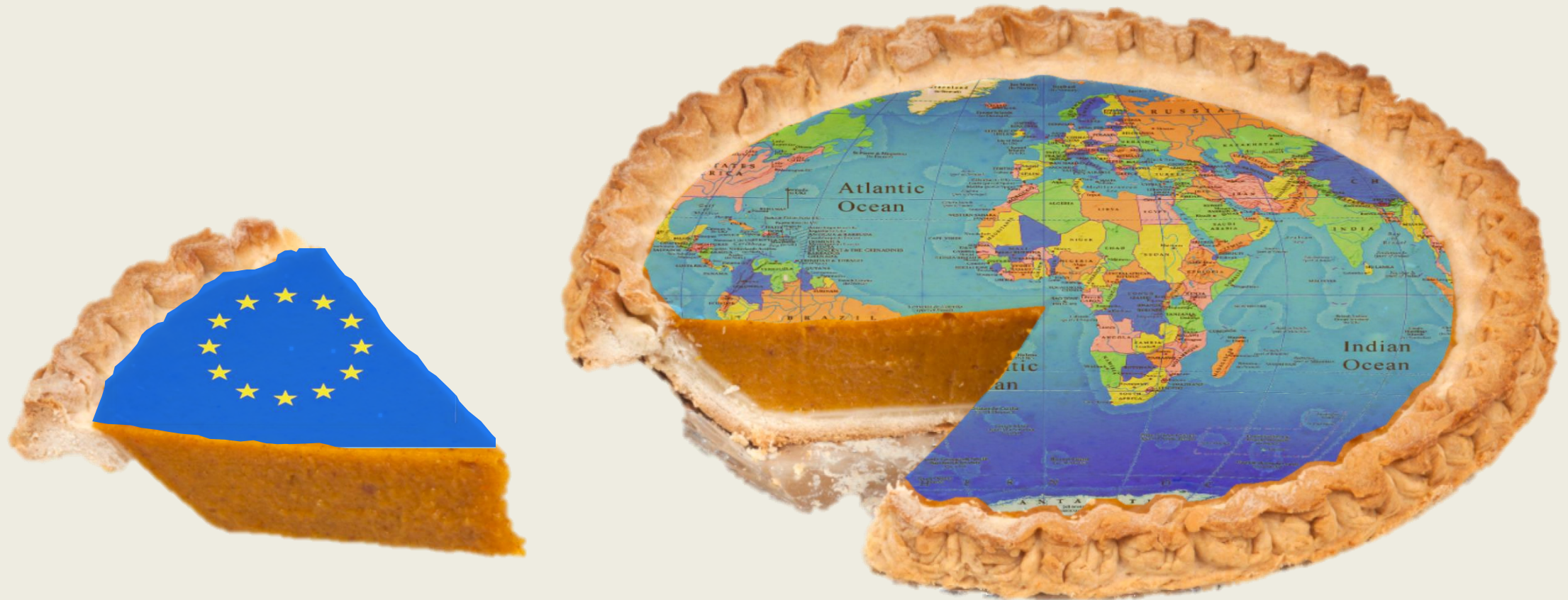


To limit warming to a 2°C rise ...

... this needs to be split
equitably amongst
all of the world's nations



What is a fair slice *(carbon budget)* for the EU?



Of the EU carbon budget ...



... how much should the UK get?



... in terms of numbers

The UK's fair Paris 2°C carbon budget for energy is

~3 to 3.8 GtCO₂ ... for 2020 to 2100 & beyond*

i.e. under **9 years** of current emissions*

**includes aviation & shipping*

Twitter: [@KevinClimate](https://twitter.com/KevinClimate)

... from budgets to mitigation rates



Headline mitigation for UK's Paris commitment

- Rapidly ramp up mitigation to **13% p.a.**
- A total reduction of around **80% by 2030** (cf. 1990)
- **~fully** decarbonised **energy** by around **2035-40**

Why such difference to the CCC?

- 1) The CCC analysis is based on 'net-zero' by 2050 (not Paris 2°C)
... ours is based on 'real-zero' inline with carbon budgets for 1.5-2°C
- 2) The CCC assume planetary scale uptake of speculative 'negative emission technologies'
... we exclude such non-existent future technologies
- 3) The CCC ignore the clear international equity steer in the Paris Agreement etc.
i.e. the CCC assume a disproportionate slice of the global 1.5-2°C carbon budget
... we embed an explicit equity dimension
- 4) The CCC analysis is for all UK CO₂
... ours is for energy, we remove CO₂ from deforestation & process emissions (cement)

'Fair' 2°C pathways for the UK

Annual emissions (MtCO₂e)
900
800
700
600
500
350
200
100
0
1990 1995 2000 2005 2010 2015 2020 2025 2030 2035 2040 2045 2050



the Car sector

Dividing the UK carbon budget

- We've established a fair 1.5-2°C budget for the UK
- There are different ways of allocating this across the UK
 - by region (*e.g. Scotland, Wales, Greater Manchester*)
 - by individual (*personal carbon allowance for adults*)
 - by sector (*aviation, shipping ... cars*)
- All have their relative merits and drawbacks

For today, our focus is on a Carbon Budget for cars ...

...& assuming all sectors have a 'fair' proportion of the remaining UK budget



For today, our focus is on Carbon Budget for cars ...

The most optimistic budget for the car sector is:

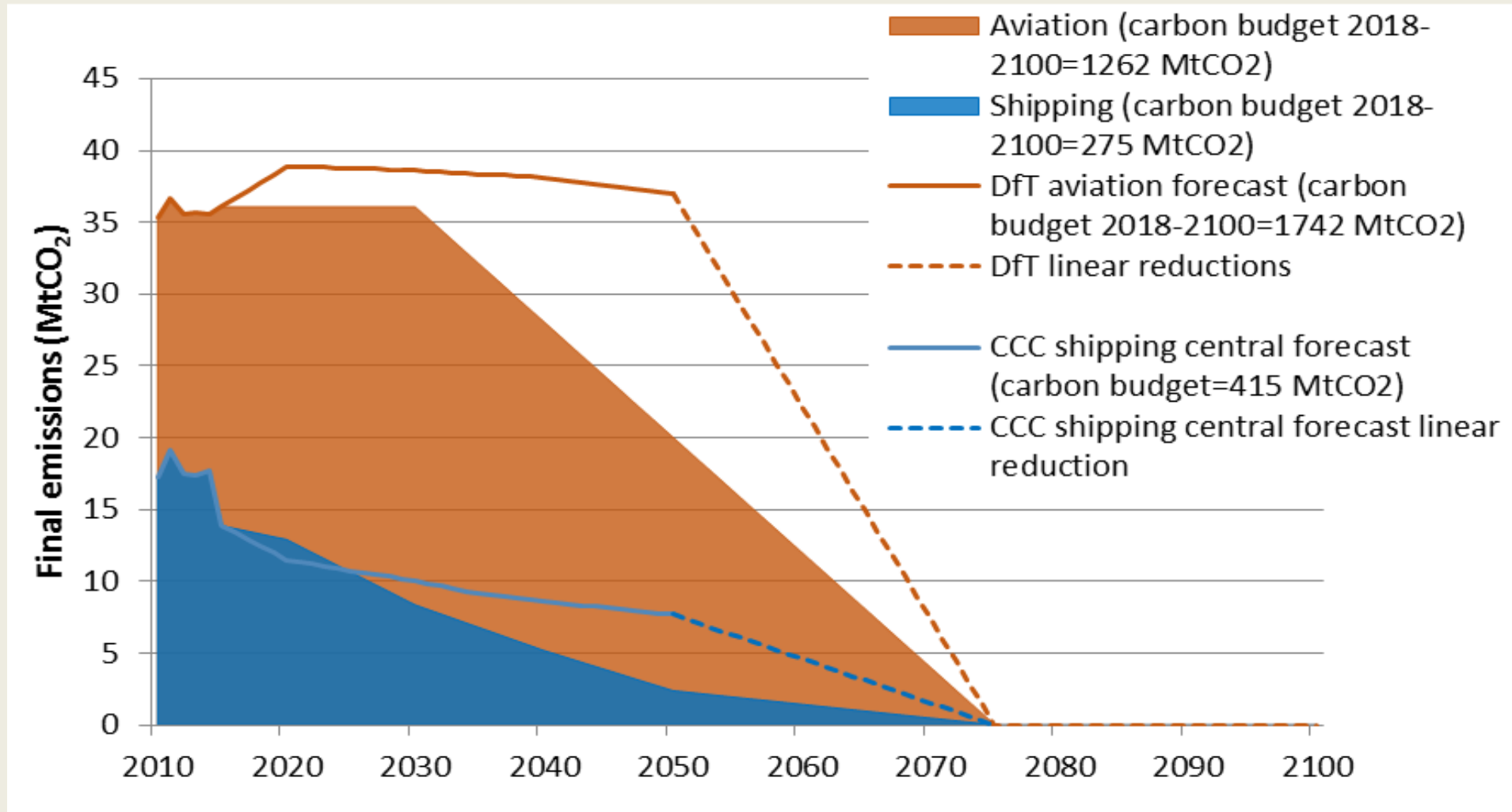
~550MtCO₂

... for 2020 onwards

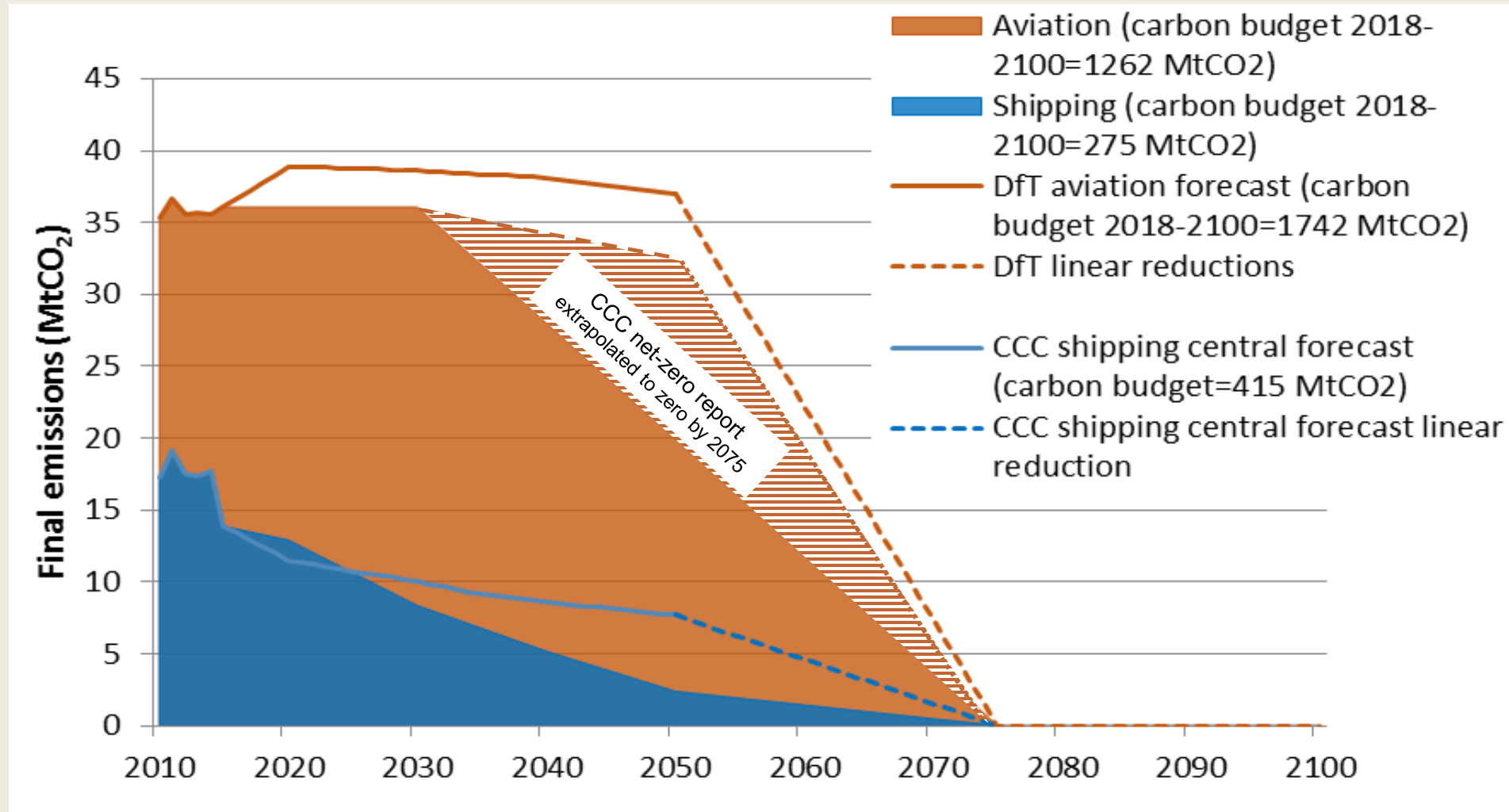
i.e. **7 to 8 years** of current emissions*



But the DfT & the CCC hugely privilege aviation



Updated in the CCC's net-zero report



But the DfT & the CCC hugely privilege aviation

The CCC net-zero aviation budget equates
to >38% of the UK's fair Paris 1.5-2°C carbon budget

*... significantly reducing the budget available for all other sectors
including terrestrial transport*

(so just ~340MtCO₂ – i.e. <5yrs of current car use)

What does this imply
for the car sector?



... for a 1.5-2°C future

- Immediate tightening of new car standards to $<100\text{gCO}_2/\text{km}$
- ~Complete transition to EV (or v.low CO_2 alternatives) by 2035
- Shift to very low carbon electricity by 2030-35 (~ 8 to $50\text{gCO}_2/\text{kWh}$)

But still need rapid reduction in vehicle-km of 40 to 60%

(higher still if aviation remains privileged)

Ultimately ...

Winning slowly is basically the same thing as losing outright. In the face of both triumphant denialism and predatory delay, trying to achieve climate action by doing the same things, the same old ways means defeat. It guarantees defeat.

Alex Steffen 2017

Twitter: @KevinClimate

Thanks for listening



MANCHESTER
1824
The University of Manchester

CEMUS
Uppsala University
SLU

Kevin Anderson
Professor of Energy & Climate Change

Tyndall°Centre[®]
for Climate Change Research

UNIVERSITY OF LEEDS
Institute for Transport Studies (ITS)